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NAVY DEPARTMENT

BUMED NEWS LETTER

a digest of timely information

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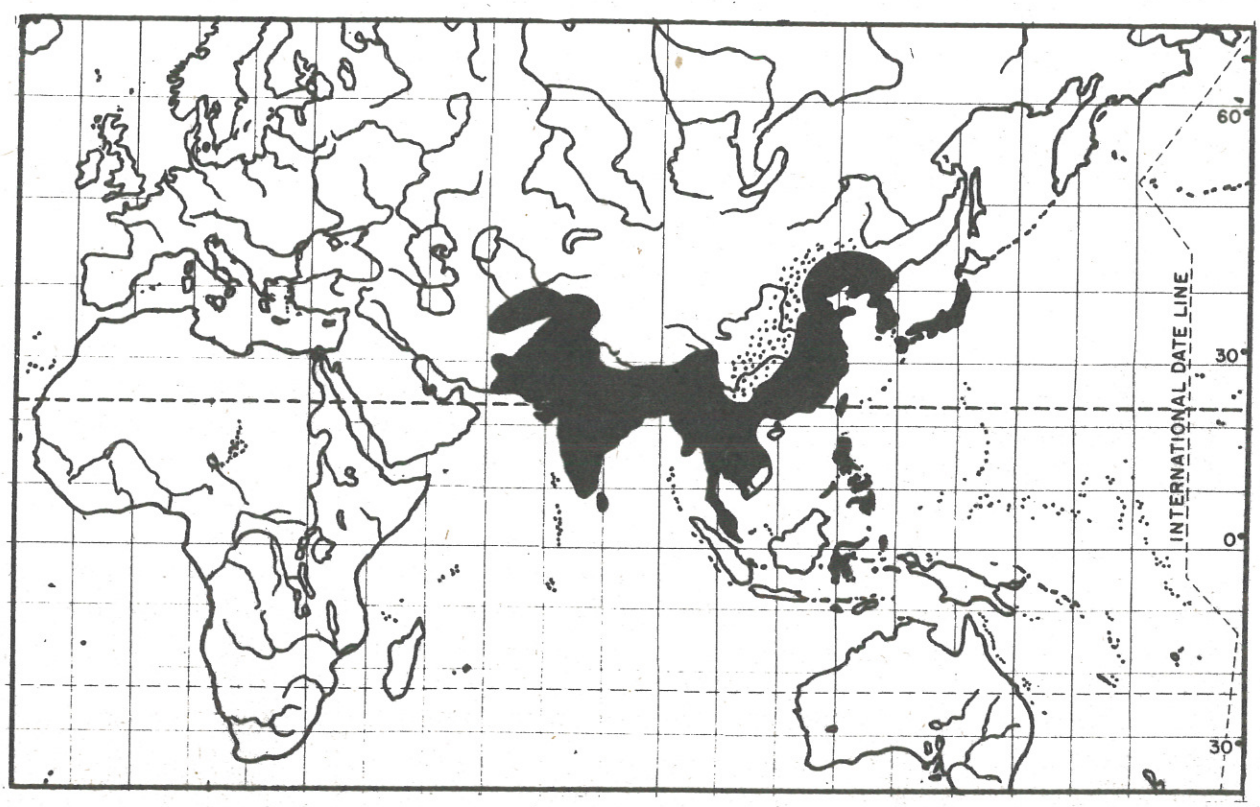
CHOLERA

Geographic Distribution: For centuries cholera has been endemic in Asia (see Map) spreading from there to both tropical and temperate regions of the globe. Numerous pandemics have originated in endemic centers in India. Outbreaks have occurred also for many years along the coastal areas of China and have tended to follow the main waterways inward. Since the beginning of the war in 1937 cholera has spread inland and large numbers of cases were reported in 1940 in Fukien, Chekiang and Kwangtung Provinces. During the summer of 1944 outbreaks were reported in India and in southern provinces of China.

Season: Although the disease occurs during all months of the year, by far the greatest number of cases develops in the spring and summer.

Transmission: The cholera vibrio gains entrance into the intestinal tract when one ingests contaminated food or drink. Infected water supplies have been responsible for many epidemics. Human carriers are a source of infection, and flies are known to transport the organisms.

Clinical Picture: The incubation period of cholera is short, ranging from a few hours to five or six days. The onset is characterized by profuse diarrhea which is usually associated with persistent vomiting. As the bowel is rapidly cleared of fecal matter, the stool soon consists of almost clear water, shreds of mucus and cellular debris (rice-water stool). With the extremely rapid and continued loss of fluid from the tissues and blood into the bowel a characteristic and expected train of symptoms and signs ensues. The body tissues shrink, thirst becomes intense, the pulse becomes rapid and weak, the blood pressure falls markedly, secretion of urine diminishes or stops, and the body temperature may become subnormal. Acidosis develops owing to loss of base into the bowel, and uremia as a result of oliguria or anuria. The severity of cholera may vary greatly, certain patients remaining ambulatory while others die within the space of a few hours following dramatic and profound collapse. When recovery takes place, although convalescence is usually protracted, serious after-effects are rarely noted. The case fatality rate is approximately 50 per cent.



Diagnosis: In the vicinity of known cases of cholera any patient developing a severe diarrhea should be suspected of having cholera and should be hospitalized immediately. Acute diarrheas from other causes must be differentiated. Severe cases of bacillary dysentery caused by the Shigella dysenteriae (Shiga) often present a similar clinical picture. In the case of diarrheas due to the salmonellae or to staphylococcal toxin, vomiting usually precedes diarrhea. An accurate diagnosis can be made only by bacteriological methods. The Vibrio cholerae may be grown from stool inocula in alkaline peptone broth. It is agglutinated by specific diagnostic sera.

Rough technics, the successful use of which requires considerable experience, include hanging-drop preparations of the feces in which the rapid rotary movement of the vibrio may be observed, and direct fecal smears stained with carbol fuchsin in which the organisms tend toward a "fish in stream" arrangement.

Treatment: While it is apparent that many of the clinical manifestations of cholera suggest the action of a potent bacterial toxin and, in fact, an endotoxin has been demonstrated, as yet no effective antitoxic sera are available. Primary treatment, therefore, is supportive and is directed in the main toward combatting dehydration and preventing acidosis and uremia.

It may be difficult to give fluids by mouth because of nausea and vomiting. Furthermore, orally-taken fluid may act to stimulate peristalsis and excretion into the bowel. However, as much fluid as can be tolerated should be administered by mouth. The presence of circulatory collapse will result in poor absorption of subcutaneously-injected fluid. Consequently, in practically all cases fluids must be given intravenously. In severe cases enormous amounts of fluid will be required for replacment, and it is important that intravenous administration be continuous throughout the day and night.

Two factors predispose to acidosis in diarrhea. First, there is a greater loss in diarrheal stools of sodium and other cations (bases) than of chloride and other anions (acids). Second, the impaired renal function incident to the dehydration results in the retention of acid catabolites.

There results, therefore, a metabolic acidosis with a decrease in serum HCO_3^- and increase in the other anions ($HPO_4^{=}$, $SO_4^{=}$ and Prot.$^-$). The starvation also leads to ketosis. When diarrhea is complicated by vomiting, the loss of chloride in the gastric juice may limit somewhat the degree of acidosis. In any instance, however, the loss of sodium and chloride will be excessive. The presence of hyperpnea may help to indicate the existence and degree of acidosis.

Because of the loss of both sodium and chloride, physiologic saline (0.85 Gm. NaCl per 100 c.c.) should be administered intravenously in large amounts. In the presence of acidosis supplementary sodium bicarbonate or sodium lactate should be added. A suitable solution of saline and supplementary sodium results from the addition of one part of M/6 sodium lactate solution or M/6 sodium bicarbonate solution to two parts of physiologic (0.85 per cent) sodium chloride solution. This provides a solution for water and electrolyte replacement with sodium and chloride concentrations approximately equal to normal serum sodium and chloride concentrations and a bicarbonate concentration great enough to correct acidosis but not excessive enough to produce alkalosis. This solution should contain also glucose in a concentration of approximately 5 per cent to provide calories and to combat ketosis.

The fever, toxemia, starvation and loss of body substance will result in a markedly negative nitrogen balance. After rehydration and electrolyte replacement, transfusions of isotonic plasma or albumin may be desirable in order to maintain an adequate plasma protein concentration. Whole blood transfusions may be beneficial in order to sustain both plasma protein and hemoglobin concentrations. Because the diarrhea and vomiting may be aggravated by the oral ingestion of food, amino acids (Amigen) may be added to the intravenous infusion up to 3 per cent concentration. If Amigen is given too fast by infusion, nausea, vomiting and hyperthermia may result.

If the serum Na and Cl remain considerably below their respective normal concentrations in spite of the infusion of physiologic saline, 1.2 Gm. NaCl per 100 c.c. may be infused for a short time. Saline solutions more concentrated than this appear undesirable.

Where laboratory facilities are available, much information as to the effectiveness of early supportive therapy may be obtained from some of the following determinations: hemoglobin, hematocrit, plasma specific gravity or plasma protein concentration (copper sulphate method), blood or serum NPN, and serum CO_2 content and chloride concentration.

Opinions differ as to the efficacy of the sulfonamides. In a study conducted in Madras under the auspices of the International Health Division of the Rockefeller Foundation (Bumed News Letter, Nov. 26, '43) sulfaguanidine was administered to alternate cases. While beneficial results with sulfaguanidine were not striking, clinical trial of sulfadiazine may be justified. However, the use of this drug carries with it great hazard of urinary complications if it is administered prior to the resumption and maintenance of an adequate flow of urine.

Good nursing care is essential. The patient should be kept comfortably warm during the period of collapse. Patients with cholera are subject to

sudden relapses, and immediate resumption of intravenous treatment may be required.

Prevention:

1. General measures in areas where cholera is endemic include: (a) maintaining a satisfactory water supply by chlorination or boiling; (b) avoidance of uncooked foods; (c) meticulous control of milk supply; (d) adequate fly control measures and (e) detection and isolation of carriers.

2. Isolation of patients and carriers should conform to rigid enteric-disease isolation standards.

3. Immunization: An immunity of short duration, probably six to twelve months, may be produced by vaccination as recommended in the Navy. The vaccine is given in two subcutaneous injections, of 0.5 c.c. and 1.0 c.c. of vaccine from seven to ten days apart. A booster of 1.0 c.c. is given every six months while in an endemic area. The vaccine is composed of a suspension of killed cholera organisms, 8,000 million per c.c. Equal numbers of organisms of the Inaba and Ogawa strains are used in the preparation of this vaccine.

Some of the vaccines used locally in China and India are made from freshly isolated organisms secured from patients during the early stage of an epidemic. Anticholera vaccines used in India are prepared from a mixture of three to six or more strains. Such vaccines in the presence of epidemics have proved beneficial in the prevention and control of cholera.

Trends of current research in the immunology of cholera are illustrated by the following:

A new type of cholera vaccine has been described by Jenning. This consists of an entire liquid culture of the vibrio, killed with phenyl mercuric nitrate and used directly in the original medium - a medium developed to support a very heavy growth. The preliminary report of the degree of immunity conferred by this vaccine is encouraging. It has the great advantage of simplicity in quantity production.

The cholera vaccines in present use are antibacterial but apparently stimulate no resistance to endotoxic substances. Burrows has purified an endotoxin in the form of a toxic phospholipid which has a molecular size small enough to permit dialysis. In a saline suspension this lipid is a non-toxic complete antigen which appears to be a considerably more efficient immunizing agent than vibrio suspensions. Further studies on the characteristics of the toxin are in progress. This work on new types of vaccine is still in the experimental stage.

Current investigations have attempted to analyze the complex antigenic structure of V. cholerae. Burrows reports that antigen "A" is found in the cholera vibrios of Group I, and recommends immunologic types designated "A", "AB", "AC" and "ABC". In such a system Ogawa strains roughly approximate type "AB" and Inaba strains correspond closely to type "AC". The application of vibrio typing to epidemiologic problems in the field should prove valuable.

4. Chemoprophylaxis: At present there is no evidence available that the sulfonamides or other chemotherapeutic agents used prophylactically are effective in the prevention of cholera. (Prev. Med. Div., BuMed - J. K. Curtis; Prof. Div., BuMed - F. A. Butler. Dr. Henry Meleney and Dr. Allan Butler kindly reviewed the manuscript and made helpful suggestions.)

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Formulae of Lactate and Bicarbonate Solutions:

Sodium Lactate M/6*	Sodium-r-lactate Distilled water	18.7 Gm. 1,000.0 c.c.
Sodium Bicarbonate M/6**	Sodium bicarbonate Distilled water	14.0 Gm. 1,000.0 c.c.

*Can be purchased in ampoules in concentrated (molar) sterile solution (which must be diluted six times) or in M/6 sterile solution from various drug manufacturers (Abbott, Baxter, Lilly, Upjohn, etc.).

**Can be obtained commercially in concentrated sterile solution (Abbott).

Also can be prepared as follows: Boil 1,000 c.c. distilled water. Remove from heater and at once add sodium bicarbonate (14 Gm.) which has been taken directly from the original container and weighed in a sterile vessel. Cover and allow to stand for 20 minutes; then cool to body temperature and use at once.

Caution: This solution should not be sterilized by boiling or autoclaving as the temperatures reached during these procedures will change the bicarbonate to the caustic carbonate.

The Medical Materiel Board has under consideration the addition of sodium lactate solution to the Supply Table.

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Penicillin in Prevention of Postoperative Empyema Following Lung Resection: A study has recently been made of the effectiveness of penicillin in the prevention of postoperative empyema following lung resection. Patients to whom penicillin was administered were paired as closely as possible with comparable controls. The treated patients received 150,000 units daily divided into equal doses injected intramuscularly at two-hour intervals for one week pre-operatively and two weeks postoperatively. No penicillin was injected locally into the pleural space before, during, or after operation unless an obvious empyema had developed, in which case the experimental result had already been determined. In the event that empyema developed in the control cases, they received penicillin therapy by various routes in an effort to control the infection. No other specific therapy was used either systemically or locally in the treated or control cases. As far as possible the operative technic was made uniform.

It was found that the patients with bronchiectasis or multiple lung abscesses who received penicillin showed no evidence of postoperative intrapleural infection, had less fever and fewer days of tube drainage, were allowed out of bed earlier and were discharged sooner than the control cases. All of the control cases developed empyema.

Penicillin was found not to be effective in preventing tuberculous empyema in patients with tuberculosis who were subjected to partial or total lung resection.

It was concluded that penicillin administered in the manner described was useful in preventing pyogenic infections following lobectomy or pneumonectomy. (White, Univ. of Pa., OEMcmr-56.)

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Penicillin in Patients with Compound Fractures: Results obtained in 28 patients with compound fractures who were given penicillin prophylactically have been compared with results in 32 similar cases which were given sulfadiazine. The penicillin appears to have been more effective, particularly in reducing the number of soft-tissue infections. In two cases the use of penicillin pre- and postoperatively permitted a successful surgical attack on a frankly infected field.

Proper debridement appears to be the most important factor in preventing infection in compound fractures, whether or not penicillin is used. (Reynolds, Univ. of Ill., OEMcmr-426; Progress Report #4, CMR Bulletin #17.)

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The Use of Penicillin in Chronic Osteomyelitis: A questionnaire was sent to nine investigators actively engaged in studying the use of penicillin in the

treatment of patients with chronic osteomyelitis of hematogenous origin. The questions asked and a summary of the replies received are presented here:

1. Do you believe that patients with recurrence or persistence of active infection can be successfully treated with penicillin alone, without surgical intervention? If so, under what circumstances?

None of the investigators thinks that penicillin alone will clear up an infection associated with formation of a sequestrum, and the great majority thinks that penicillin treatment is most effective in these cases when combined with surgery. It is believed that penicillin given preoperatively is of great value and that emphasis should be on preoperative rather than postoperative chemotherapy. An acute flare-up without sequestrum formation may subside with penicillin treatment alone, but there is no assurance that the drug will have a curative effect, and it is probably wiser to carry out surgery in all such cases. Chronic infections of the pelvis and other flat bones and of vertebral bodies may become quiescent for long periods after penicillin therapy; this is helpful in the management of cases in which the lesions cannot readily be approached for radical surgical treatment.

2. What dosage do you recommend, and how do you determine the duration of preoperative therapy?

Most investigators use 160,000 to 200,000 units per day for 3 to 5 days preoperatively and continue treatment at this level for about a week after operation. A typical course of treatment would involve 20,000 to 25,000 units every 3 hours intramuscularly for 3 days before operation and a week after operation.

3. When surgery is performed, what findings do you use as a guide in determining the scope of the surgical procedure?

All investigators recommend removal of sequestra, and seven specifically recommend excision of all obviously infected scar tissue and bone. Only one recommends complete saucerization.

4. How early do you permit the operative wound to close?

Four of the reporters practice primary closure of the operative wound following preoperative preparation with penicillin. One recommends prolonged Orr treatment with changing of plaster casts every 1 to 3 weeks. The others leave the wounds open but permit them to close spontaneously and find most wounds healed within 14 days.

5. Do you use penicillin locally in the wound? Why? How?

Eight investigators use penicillin locally in some form. Three use small catheters to introduce drug solution into the wounds for a few days after operation, and three use daily reapplications in conjunction with change of dressings. The justification for local penicillin is to hold down bacterial growth to a minimal level during formation of the primary wound barrier.

6. Have you encountered secondary recurrences of infection in lesions treated with combined surgery and penicillin?

Six of the ten reporters have seen secondary recurrences of local infection. One attributes these late recurrences to the presence of resistant or Gram-negative organisms and two attribute them to inadequate surgery.

7. Do you distinguish between infections of cortical bone and cancellous bone in respect to the probable results of penicillin therapy?

There was no consistent tendency to differentiate between infections of cortical and those of cancellous bone in respect to end results of penicillin treatment.

8. To what extent does the presence of Gram-negative bacilli or other penicillin-resistant organisms interfere with the results of combined penicillin and surgical treatment?

Two individuals believe that the presence of Gram-negative organisms interferes with the successful use of penicillin in chronic cases. However, three state that the presence of Gram-negative organisms is of little importance provided surgical treatment is adequate. A large majority of those reporting seems to believe that the presence of Gram-negative organisms does not require any difference in the type of management from that used in cases with pure cultures of Staphylococcus aureus. (CMR Bulletin #19).

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This questionnaire was prepared by J. S. Lockwood. Investigators consulted were: W. A. Altemeier, D. G. Anderson, J. Buchman, O. J. Hermann, J. W. Hirshfeld, R. D. McClure, F. L. Meleney, A Ochsner, and J. E. Rhoads.

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Penicillin in Treatment of Congenital Syphilis: Satisfactory follow-up observations for 4 months or more are available for 25 of a group of 33 cases of congenital syphilis treated with 20,000 units of penicillin per kg. "Of these 25, all except one are apparently cured of all manifestations. This one infant had clinical relapse on roentgenographic evidence only - recurrence of osseous

lesions 6 months after completing therapy and 2 months after a sharp rise in serologic titer."

An additional 50 cases have been treated on the same schedule. None has been followed as long as 4 months but clinical improvement occurred in all except one infant, moribund at the initiation of therapy.

"Reactions during treatment have been noted in about 1/3 of all cases. These consisted of transient urticaria (in only 2 infants) and fever, usually not exceeding 102°, and occurring within the first 3 days of administering penicillin." (Platou, Tulane Univ., OEMcmr-461; Progress Report #2, CMR Bulletin #17)

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Physiologic Effects of Drinking Undiluted Sea Water: Men cast adrift on the open sea without fresh water often succumb to the temptation to drink sea water. It has been stated that the drinking of sea water is probably, next to exposure to cold, the most common cause of death under such conditions. Although the existence of an unfavorable response to such ingestion has been widely recognized, there has been no agreement concerning the exact nature of the disturbance or its physiological basis. In a recent paper Elkington and Winkler review certain recent clinical and experimental observations which indicate the cause of these deleterious physiological effects.

Although there are many differences among the symptoms exhibited by men who have ingested large amounts of sea water, disturbances of the nervous system generally predominate. The mind is usually affected, and suicidal attempts are common.

Modern views seek to relate the ill effects of the drinking of sea water in some way to its hypertonicity, since large amounts can apparently be ingested if sufficiently diluted with fresh water. Sea water is a salt solution with an average concentration of 3.5 per cent. The principal cation is sodium and the principal anion chloride. Magnesium and sulphate are also present in smaller amounts, but these ions are not in themselves toxic when ingested orally. They may cause diarrhea. In composition, therefore, sea water closely resembles vertebrate extracellular fluid, except that its total ionic concentration is about four times as great. Since the highest recorded concentration of sodium as sodium chloride in human urine is 1.9 per cent, the ingestion of undiluted sea water presents a dilemma to the organism. Either some of the ingested sodium chloride must fail of excretion, or body water must be sacrificed in order that the salt may be excreted in its entirety in the urine. The physiologic dilemma is only aggravated by the fact that part

of the salt in sea water is magnesium sulphate, because ingested magnesium and sulphate are largely excreted by the intestine in isotonic solution. They require, therefore, even more water per mol for their excretion than do sodium and chloride, which are excreted in hypertonic solution in the urine. The actual response of the organism will inevitably depend on many factors, including the state of hydration of the body and the rate of ingestion of sea water. In any case hypertonicity of the body fluids must result. The character of this hypertonicity depends, however, on whether or not salt is retained. With no retention of sodium chloride, loss of fluid is distributed over both extracellular and intracellular compartments in proportion to their initial magnitudes. With retention of this salt, however, a new situation develops, since sodium and chloride are largely excluded from the cellular phase of tissues. Any sodium or chloride retained from sea water must be confined mainly to the extracellular phase, with a resultant osmotic shift of water from cells to extracellular fluid. Contraction of the extracellular phase is therefore minimized at the expense of an exaggerated depletion of the intracellular fluid.

The authors administered sodium chloride to dogs, while the total water intake was unchanged or slightly decreased. The tonicity of the body fluids rose sharply. There was a large retention of sodium and chloride and, as a result of osmosis, a large shift of water from the intracellular to the extracellular phase.

In other experiments, small amounts of a 5 per cent solution of sodium chloride were given repeatedly for 4 to 6 days to animals previously deprived of food and water for some time. In spite of this prior dehydration, the body sacrificed still more of its water and eliminated some but not all of the ingested salt in the urine. Because of this retention of salt and loss of water, hypertonicity of the body fluids rapidly developed. Water without base was withdrawn from the intracellular compartment in response to the retention of sodium chloride in the latter. Some potassium salts also were lost from the cells during this process. As a result, extracellular volume was fairly well maintained in spite of progressive total dehydration, while the intracellular fluid bore the brunt of the loss. The intracellular dehydration progressed steadily until the end. Concentration of salt in the urine gradually rose. At no time, however, did the concentrations of these ions in the urine equal those in the solution injected.

Shortly before death the animals exhibited various disturbances of the nervous system, including tremors, hyperactive reflexes, motor incoordination and finally irregular and failing respiration. The circulation in the meantime continued to function well. There was no decrease in the plasma volume, such as is commonly seen in peripheral vascular collapse; renal excretion remained active; the pulse was vigorous, and electrocardiograms were normal. The picture was clearly not one of circulatory failure, either of the cardiac

muscle or of the peripheral circulation. The terminal event was failure of the respiration.

These experiments indicate that following the continued ingestion of hypertonic sodium-chloride solution, owing to the retention of some of the salt, the extracellular fluid tends to be maintained at the expense of excessive depletion of intracellular fluid.

No direct experiments involving the later stages of ingestion of hypertonic saline solution by human beings are available, and one can only reason by analogy with these experiments on dogs. The clinical behavior of those survivors of shipwreck who persistently drink sea water lends support, however, to the validity of this analogy. The status of these subjects is comparable to that of the dogs which, following deprivation of water and food, had received hypertonic saline over a considerable period of time. Functional disturbances of the central nervous system predominate over any signs of cardiovascular collapse. This is precisely the result which might be expected if the extracellular fluid volume were maintained at the cost of severe intracellular dehydration. Both from the experiments on dogs cited here and from many other sources it is clear that the plasma volume and the integrity of the peripheral circulation depend primarily on the state of the extracellular rather than the intracellular fluid. Both volume and salt concentration are important; but with only moderate reduction in the former and with hypertonicity of the latter there is no physiologic reason why the circulation should be inadequate. Disturbances of the central nervous system, on the other hand, were present in the authors' experiments on dogs and were there associated with extreme intracellular dehydration. Under some conditions cells apparently can function until they lose 40 to 50 per cent of their water, but there must be a limit to the degree of desiccation in which the complex metabolism of the cell can continue. Participation of the cells of the central nervous system in the general cellular dehydration would explain the clinical manifestations both in these dogs and in the survivors of shipwreck drinking sea water. Such intracellular dehydration would necessarily result if the renal reactions of human beings in the later stages parallel those of dogs. (War Med., Oct. '44.)

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Plastics for Bone Grafts, Bone Support and Fracture Pinning: Captain G. Blum, RAMC, has continued his studies on improved plastics for bone grafts, bone support and fracture pinning. The non-absorbable transparent plastic, methyl methacrylate, may be applied and molded into the desired shape as a soft "dough". Then by the application of ordinary ultraviolet light full hardening can be accomplished in 15 minutes. Captain Blum has also studied absorbable protein plastics extensively. These are prepared

by treating casein, fibrin, whole blood or red blood cells with formalin. Depending on the treatment almost any hardness can be obtained. Screws, pins, plates, etc., can be made of sufficient strength to bear the required weight and to withstand operative manipulation. Admittedly these absorbable plastics are not as strong or as non-frangible as steel. Casein and fibrin plastics placed in animals' bones disappear, i.e., are absorbed, in six months. Blum has estimated that plastics of the size ordinarily used in human patients would be absorbed in about a year. Microscopically, in contrast to the methyl methacrylate plastics, there is very little foreign body reaction about the absorbable grafts, pins or screws. Recently two patients have had major fractures pinned by casein screws. No difficulties were encountered in the applications; it is too early to report results. There is one minor disadvantage to the use of these protein plastics. They are not radio-opaque. (G. Blum, from report to meeting of Middlesex Physiological Society. CMR, London News Letter #113, Southworth.)

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Resuscitation of the Severely Wounded: Recently a report was made to the Associate Committee on Army Medical Research of the National Research Council of Canada by Lt. Col. A. L. Chute, O.B.E., Commanding Officer, No. 1 Research Laboratory, RCAMC. This report represents observations made and opinions formed by the members of the Research-Laboratory Unit and other surgeons in the Italian Theater of Operations as a result of a careful clinical and laboratory study of casualties.

Signs of Shock: Clinical signs are sufficiently definite to make assessment of the severity of wound shock practical. Since early and adequate treatment is the keystone of success, it is imperative to recognize and weigh the relative importance of each sign. There are no readily available laboratory tests which will supply this information.

The extent and nature of the injury are of prime importance in evaluating the condition of the casualty. It is essential to emphasize that wounds should be carefully examined in an endeavor to determine their seriousness. This information must be correlated with the signs discussed below if adequate treatment is to be given.

Paleness usually indicates a moderate degree of shock. Those who have suffered excessive blood loss are chalky white. Cyanosis of lips, lobes of ears and finger tips may be present in the severely wounded. In very severe collapse the skin of hands, feet and other parts of the body may be a blotchy purple. The color of the skin, blanched by pressure, returns slowly on release, indicating abnormally slow capillary refilling.

The extremities and nose are usually cold in cases of severe wounding. The general body temperature may also be reduced but some patients may have a slight elevation of temperature. The forehead becomes cold in the gravest cases only.

Constriction of peripheral veins is characteristic of the moderately and severely wounded. Veins normally large are reduced to mere threads; filling is poor when the venous return is obstructed, and only a little dark blood may be obtained on venipuncture. Venous blood is more easily obtained and is redder in less severe cases. The presence of constricted veins and cold extremities is an important sign in moderate weather but may be less significant when the environmental temperature is low.

Respiratory rate is often slightly or moderately increased in the severely wounded. Breathing of the air-hunger type is seen in the severely exsanguinated and in cases with a large pneumo- or hemothorax. An increased respiratory rate due to apprehension is controlled by a sedative. Extreme restlessness is rare. It is seen in association with air hunger. Manifestations of pain are neither marked nor common in the severely shocked.

Dryness of the tongue is frequently present in the wounded. It is important to note such cases as they require plenty of saline or glucose-saline in the course of resuscitation in addition to the plasma and blood considered necessary. Thirst is present in such cases and is seen also following moderate to severe blood loss in well hydrated individuals.

The volume of the pulse is of much greater significance than the rate. It gives an indication of the volume of blood flowing through the vessels. A pulse of poor volume indicates that the patient is in a precarious state, even though the blood pressure may be at or above normal levels. The pulse rate is usually accelerated, but may be normal or even slow in some cases. Rates in excess of 140 should be regarded as serious.

The systolic blood pressure may be below normal, normal, or markedly elevated (160-190 mm.) in severely shocked patients. It must not be used as the sole criterion of the patient's condition, but rather correlated with the observations noted above. Prolonged low blood pressure (below 80) is withstood poorly and calls for rapid fluid-replacement therapy. Hypertensive cases show a return of the pressure to normal when transfused.

A variation in the systolic blood pressure in the course of the respiratory cycle is frequently seen in the severely wounded. A fall of 10 to 20 mm. may occur in inspiration. This is taken to indicate an inadequate venous return to the heart. It tends to disappear as the patient is resuscitated. This condition is often seen after an anesthetic, probably as a result of peripheral vasodilation. A diastolic

sound which is indistinct or difficult to obtain is a further sign of the seriousness of the patient's condition.

Resuscitation: Relief of pain is best achieved by injecting morphine, 0.01 to 0.015 Gm. intravenously. This method of administration gives quick positive relief and avoids the possibility of overdosage from simultaneous absorption of morphine from the sites of several subcutaneous injections when the circulation improves. Every effort should be made to secure rest and quiet.

There is frequently a tendency to overheat a seriously wounded patient. Heat, by overcoming the protective peripheral vasoconstriction, may aggravate the patient's condition and thereby lead to a further fall in blood pressure. Blankets alone should be applied to the severely shocked until a transfusion is well under way, at which time one or two hot water bottles with a blanket between them and the patient may be used. In patients with very poor peripheral blood flow even moderately warm water bottles placed next to the skin may cause burns. "Keep the patient comfortable" is a good motto.

Elevating the foot of the stretcher or bed may cause some improvement in the blood pressure of the moderately wounded.

Oxygen should be given to patients with cyanosis, particularly if they are known to have chest injury.

Fluids by mouth are important if given a sufficient time before operation. It is better to give frequent small drinks rather than large single ones which tend to make the patient vomit. Patients with abdominal wounds should be allowed to rinse their mouths with but not swallow fluids.

Fluid-replacement therapy is by far the most important means of combatting shock. Generally speaking, a case which has been wounded severely enough to require resuscitation has lost at least 700 to 1,000 c.c. of blood. To replace this there is no question that blood of good quality is the fluid of choice. There are two factors which make it necessary to modify the exclusive use of blood for transfusions:

1. It is impossible to provide and keep in suitable condition the amount of blood that would be required.

2. Even with the strictest care in preparing and keeping stored blood, some blood when transfused will hemolyze to a certain extent.

If massive blood transfusions (6 to 8 bottles) are given, the chances of getting post-transfusion hemolysis with possible kidney damage are greatly increased. The urgent immediate need of most casualties is a restoration

of blood volume rather than of the oxygen-carrying powder of red cells. Consequently, plasma should take the place of part of the blood in cases requiring transfusion.

The importance of speed in initial administration of fluid is a point which is not always fully appreciated. In severe wounds, where the blood pressure is below 80, two bottles of plasma and one of blood or vice versa should be given within one-half to three-quarters of an hour. If one transfuses too slowly, the pressure may never rise. In those patients with less serious wounds and with normal or mild reductions in blood pressure, it is better to run in the fluids more slowly.

Two to three bottles of blood or plasma restore the blood pressure in most cases, but measurement has shown that an additional bottle or two will be required actually to restore the blood volume.

If greater amounts of fluid than this are required to restore the patient, it is well to reexamine him carefully to ascertain the cause. Bleeding may have recurred; or gas infection may have developed in injured muscle. In such cases even adequate restoration of the blood lost may not restore the pressure to normal. Extensive muscle injury may have a similar effect possibly because of toxins liberated from muscle. These cases require surgery even if their blood pressure cannot be restored to normal, and in fact the surgical control of bleeding and the removal of dead and infected muscle is a prerequisite to resuscitation. Fat embolism, although it is not common, may explain the failure of some patients to improve with resuscitation.

Rapid transfusions of blood or plasma often cause severe rigor. In extreme cases morphine 0.01 Gm. may be given intravenously and the rapid transfusion continued. This usually controls the rigor. In less urgent cases slowing the rate or interrupting the transfusion for a short time is usually effective.

It is not desirable to administer cold blood. It constricts veins and seriously reduces the rate at which it can be given. Blood may be warmed by leaving it at room temperature for an hour or two. Especially should this be done if many casualties are expected. To remove the extreme chill of a bottle of blood quickly, one may place it in luke-warm water for 10 to 15 minutes, or one may place hot water bottles over the intravenous tubing leading to the patient's arm. Blood should never be overheated, e.g. by placing in a can of water on a stove. Excessive heat will hemolyze blood. Such blood may lead to irreparable renal injury if used for transfusion.

Saline or preferably glucose-saline may be given profitably to all patients being transfused. Most casualties have depleted water stores if not frank dehydration. More than one bottle of such fluid is indicated

preoperatively in patients with abdominal wounds who have dry tongues. This may be given either before or after the pressure has been adequately restored; if injected before, it should be given quickly. Patients without abdominal injury should be encouraged to take fluids by mouth providing they are not going to operation within a short time.

The adequacy and effectiveness of transfusion can be judged in several ways. The return of warmth to the skin is one of the best. It indicates that the circulation has improved and vasoconstriction relaxed. Elevation of a low blood pressure to normal levels and its maintenance there, or the depression of an elevated pressure, are valuable indices of improvement. The changes in blood pressure may occur before or without return of warmth to the skin, and therefore give a premature sense of security. A decrease in heart rate and an improvement in the pulse volume are valuable additional signs of improvement, but the heart rate may not decrease if it has not previously been over 120. The respiratory variation in the level of systolic blood pressure decreases with an adequate response and the diastolic sound becomes clearer cut.

Resuscitation of Cases with Specific Types of Injury

Head Injuries: If there is evidence of intracranial injury, these cases should not receive transfusions unless there are other gross wounds.

Chest Injuries: Ideally these cases should not be transfused until the chest is aspirated. However, in severe shock a slow blood transfusion should be started immediately. The amount of blood withdrawn from the chest is an index of the amount of replacement required. It is believed by some surgeons that it is better to "under-transfuse" these cases in order to avoid pulmonary edema, i.e., to give 300 c.c. less than the amount withdrawn from the chest. Sucking chest wounds must be closed by air-tight packs until such time as they can be closed surgically.

Abdominal Injuries: The amount of blood lost and the depth of shock in penetrating wounds of the abdomen vary greatly. An estimate must be made on the basis of the clinical signs previously enumerated and the amount of blood or plasma to be given calculated accordingly. When the hemorrhage has been large, as with laceration of the spleen, the transfusion must be rapid and composed of at least as much blood as plasma. A total of 6 to 8 bottles may be required.

Most patients with abdominal injury require an average of two bottles of blood and two of plasma. If there is much dehydration, it is advisable to give glucose-saline as well. The saline and plasma may be given first. The blood is best reserved for administration immediately before and during the operation.

Large Injuries: Large injuries such as those with extensive muscle damage (3 fistfulls) associated with compound fractures should be given at least one bottle of blood followed by two of plasma. Many require much more. As mentioned before, pressures may return to normal with one or two bottles but a further amount of fluid equal to that already given is needed to restore the blood volume. In cases requiring 5 to 6 bottles of fluid to restore their blood pressure, one or two additional bottles are usually sufficient.

In cases when rapid and adequate transfusion is not successful, operation is indicated even in the presence of low blood pressure.

Fractures: Patients with fractures or amputations involving only a leg or an arm can be resuscitated with plasma alone, unless there is blood loss. Patients with cross fractures of the femur or multiple fractures usually require one or two bottles of blood as well. In such cases it is wise to start administration of blood just before operation, since considerable operative blood loss must be expected.

Postoperative Resuscitation: Severely wounded patients, especially those with abdominal injuries who, following operation, have low blood pressure and circulatory impairment, should receive careful supervision by a medical officer.

These cases should be handled as little as possible and should not be taken off the stretcher to be put into bed. The foot of the stretcher should be raised about one foot above the head. They should have the blood pressure checked every one-half to one hour. If there is evidence that much blood was lost at operation, replacement is indicated.

When the patient's circulatory adjustments have been made, he may be transferred to bed. Less serious cases are better put to bed immediately, preferably while still under the anesthetic.

Abdominal cases on continuous gastric suction should have at least 3,000 c.c. of intravenous fluids every 24 hours of which at least 1,000 c.c. should be plasma and the rest glucose-saline. Some cases lose large amounts of fluid from their gastric suction and may require 4,000 c.c. daily. Signs of adequate therapy are a moist tongue and a urinary output of 1,000 c.c. or more in 24 hours. A careful check on the state of the lungs will aid one in avoiding the administration of excessive amounts of fluid.

The need of serious postoperative cases for careful supervision by a trained medical officer is not always recognized. Several surgeons have commented on the frequency with which patients die from shock a few hours following operation. If the same attention were paid to these cases postoperatively as is given in the resuscitation ward, a number undoubtedly could be saved.

Intercapillary Glomerulosclerosis: Laipply et al. have studied the clinical records, autopsy protocols and microscopic sections of 332 patients in order to determine the incidence of intercapillary glomerulosclerosis among diabetic and other patients and to correlate its occurrence and development with distinctive clinical manifestations.

Intercapillary glomerulosclerosis was first described by Kimmelstiel and Wilson in 1936. They reported 8 cases in which different stages of the renal lesion were present. In all but one instance there was a history of diabetes mellitus, usually of long standing, widespread edema of renal origin and pronounced albuminuria. In some cases hypertension and renal insufficiency also were present.

The typical lesion of intercapillary glomerulosclerosis is usually spherical and occasionally oval. It varies from 20 to 110 micra in maximal diameter and is made up of faintly acidophilic acellular hyalinized tissue. With low magnification it appears homogenous, but high magnification reveals small vacuoles, and the Wilder silver stain frequently makes evident circumferential lamination. The hyaline material does not have the specific staining properties of amyloid. It stains either red or blue with the Mallory-Heidenhain azocarmine and pale yellow with the Van Gieson stain. Small droplets of fat are not uncommonly present in the hyaline material. These are, however, no more numerous and no larger than the lipid droplets which occur in the kidneys of non-diabetic persons and of persons with diabetes without typical lesions. Consequently, it is impossible to attach much differential significance to these lipid deposits. At the periphery of the lesion there are usually one or more concentric layers of flattened cells, presumably endothelial. The involved glomeruli sometimes are small but more frequently are of normal or larger-than-normal size.

Laipply and his co-workers found intercapillary glomerulosclerosis to be a common lesion in their series of patients with diabetes, occurring in 63.7 per cent of 124 patients. On the other hand, the characteristic lesions were found in only 5 of 208 patients with renal disease but without diabetes. No demonstrable relation was found between the degree of its development and the duration or degree of the diabetes. Among diabetic patients with intercapillary glomerulosclerosis, hypertension was present in 64.4 per cent, albuminuria in 81 per cent, the nephrotic syndrome in only 6.3 per cent and uremia in 17.7 per cent. No correlation was found between the degree of intercapillary glomerulosclerosis and renal arterial or arteriolar sclerosis.

Intercapillary glomerulosclerosis was found just as frequently as hyalinization of the islets of Langerhans at necropsy in patients who had diabetes mellitus. (Arch. Int. Med., Nov. '44.)

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Treatment of Condylomata Acuminata with Podophyllin: Condylomata Acuminata, frequently designated by the misnomer "venereal warts", are annoying growths of uncertain etiology, usually affecting the genitalia. Treatment has hitherto been unsatisfactory.

Recently Culp and Kaplan (Annals of Surgery, 120:251, August 1944) reported prompt and effective cures in a series of 200 cases of condyloma acuminata treated with podophyllin. The drug, a resin of Podophyllum Peltatum, is described as a light-brown, or greenish-yellow powder. For treatment of condylomata acuminata the authors recommend that a 25 per cent suspension of the powdered drug in mineral oil be applied to the surface of the lesion with a cotton swab, and be washed off 24 hours later. They state that the treatment is painless, requiring no anesthesia nor hospitalization, and that no systemic nor immediate local reactions occur. According to their description, the growths appear blanched within a few hours after application of the suspension, and become necrotic 24 to 48 hours later. The condylomata slough on the second or third day, and promptly disappear, leaving no ulceration nor scarring.

All of the 200 cases reported in this series were cured regardless of the number, size, location or duration of the growths. The lesions were located on the penis of 168 patients, on the female genitalia of 15 patients, within the male urethra of 10 patients, on the anus of 4 patients, on the male perineum of 2 patients and on the scrotum of 1 patient. Only one application was required to cure 81.5 per cent of the cases, and an additional 14.5 per cent recovered after a second treatment. In no instance were more than four applications necessary. In 72.5 per cent of the cases complete cure was effected within 4 days, and in only 6.5 per cent was recovery delayed longer than 8 days. No discomfort was experienced by 83.5 per cent of the patients, and only 2 per cent required any sedation. There were 9 known recurrences within 1 to 6 months. The recurrent lesions disappeared after one treatment in 8 instances, and two treatments in the other. Several patients were followed for as long as 9 months without recurrence.

The authors have found the oil suspension and powdered drug also to be useful in removing excessive granulation tissue from surgical wounds, but of no value in the treatment of typical horny verrucae, of condylomata which occur late in the course of syphilis, or of benign rectal polypi. They refer to a report of excellent results obtained by Tomsky, Vickery and Getzoff (Journal of Urology, 48:401, 1942) in the treatment of granuloma inguinale with podophyllin.

At the Rockefeller Hospital recently there has been an opportunity to try therapy with podophyllin upon a patient with condylomata acuminata. Lesions had appeared about 6 months previously, increasing in size and number to a

total of 9 at the time of treatment. They were located on the shaft of the penis beneath the prepuce adjacent to the coronal sulcus and the frenum. After one application of 25 per cent podophyllin in mineral oil, which was washed off 24 hours later, the lesions behaved as described by Culp and Kaplan and disappeared in 4 days, leaving a clean, denuded surface. It was found that application of boric acid ointment relieved irritation of this sensitive area until complete healing had taken place 2 days later.

Attention is called to this new, useful and apparently effective form of therapy. (Nav. Med. Res. Unit at Hosp. of Rockefeller Inst., E. C. Curnen)

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Salt Water Washing for Hospital-Ship Laundries: The procurement by the Navy of a detergent powder which permits the use of salt water in laundries was mentioned in the Bumed News Letter of September 29, 1944.

In medical activities the demands on the laundry are relatively great. Consequently, the salt water "soap" is ideally suited for use on hospital ships and in advance-base hospitals where supplies of fresh water may be restricted.

The detergent powder cannot be depended on as regards antisepsis. Navy Regulations, Article 1324, forbids the use on board ships of sea water from polluted harbors. The use of such harbor water even for laundering and rinsing will be risky, unless bacteriocidal temperatures can be maintained.

Production and procurement have not kept pace with the demand, and supply officers requisitioning this detergent powder may experience some delay in obtaining it. However, early improvement in this situation is anticipated.

A description of this detergent powder and instructions for its use can be found in BuShips letter, JH1(336), EN28/A2-11, of July 28, 1944. Instructions for its use are given also in BuShips Spec. 51S47(INT), of April 1, 1944 - Soap, Salt-Water, Powdered (for Use in Soft, Hard or Sea Water). These instructions are reproduced on a 6 x 8 inch card placed inside the soap container.

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Control of Tuberculosis in the Navy: A Tuberculosis Control Section was recently established in the Preventive Medicine Division. This Section assumed the functions previously assigned to the Tuberculosis Case-Finding Unit of the Physical Qualifications and Medical Records Division, and is expanding the case-finding activity into a broader control program.

The first responsibility of the Section is supervision of the technical and professional quality of the examinations. Complements have been established for both the stationary and the mobile photofluorographic units, which examine approximately 10,000 persons each month, such complements consisting of one especially-trained medical officer, one X-ray technician, one photographic technician, two expert clerical men and two men of lower rates as general helpers under instruction.

The second responsibility is case-finding. Photofluorographic equipment has been made available for the annual examination of personnel under the age of 30 and for the semi-annual examination of personnel of all ages who are known to have healed or arrested lesions of tuberculosis. Stationary photofluorographic units have been placed in navy yards, receiving barracks, and distribution centers. The choice of location depends solely upon the estimated monthly total of examinations; equipment having been assigned only when this estimated total approximates or exceeds 10,000. In addition, stationary units will be assigned to discharge centers, as such centers are designated, for examination of personnel at the time of discharge or release from active duty. Eight mobile photofluorographic units, now being procured, will provide service to shore stations to which stationary units have not been assigned.

Navy #128 now has stationary photofluorographic equipment. Portable or mobile units are being procured for use overseas for examination of service and civilian personnel.

Control measures are being developed along the following lines:

1. Case-finding.
2. Establishment of a Central Registry of Personnel who have been reported by Boards of Medical Survey.
3. Examination of Contacts.
4. Periodic Examinations of Arrested Cases.
5. Development of an Educational Program.

Examinations of contacts are made as a result of information obtained from Reports of Medical Survey and from mass case-finding X-ray examinations.

Personnel returned to duty with arrested minimal lesions are reexamined by means of an X-ray of the chest at intervals of six months. Personnel with arrested lesions returned to limited duty are reexamined by Boards of Medical Survey at intervals of six months to determine fitness for full duty.

It is planned to carry out the educational program, in connection with the annual chest X-ray examination, by means of "story-telling" poster series, suitably arranged in the dressing rooms and along the waiting line.

Facilities for the study and treatment of all cases found are present in all naval hospitals. Two large general hospitals have been especially designated to care for tuberculous patients and are provided with all modern facilities for the medical and surgical treatment of the disease. Patients are retained for treatment until beds in a Veterans' Administration Facility become available.

It is now possible for the commanding officer of a naval vessel to obtain for the personnel of his crew the required examinations in most continental ports and in Navy #128. A gratifying use of these facilities is already evident and their further use is encouraged. Little time is required for the examinations, as a well organized photofluorographic unit can examine from 125 to 150 persons every hour.

Paragraph 3 of BuMed Letter to All Ships and Stations, P3-3/P3-1(054-40) dated June 13, 1944, reads as follows:

"Roentgenographic examination of the chest of all Naval and Marine Corps personnel on active duty who have not been so examined during the last twelve months shall be made at the earliest opportunity. Thereafter, chest examinations of personnel on active duty under the age of 30 shall, if practicable, be made at least once a year."

This is construed to mean that all persons being "processed" through a naval activity in which a photofluorographic unit is available, who require a chest X-ray, be so examined. The successful attainment of complete coverage of all personnel will depend upon the establishment of a definite routine, similar to that used in checking immunization procedures, at naval activities having photofluorographic equipment. (Prev. Med. Div., BuMed - T. J. Carter)

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Salt Tablet with Prolonged Solution Time: A salt tablet impregnated with cellulose acetate or cellulose nitrate has been developed at the Naval Medical Research Institute. By virtue of its cellular structure, this tablet dissolves very slowly, usually within 80 minutes. This slowly dissolving, impregnated tablet causes significantly fewer gastrointestinal symptoms than the currently-used fast dissolving salt-cornstarch tablet and the formerly-used pure salt tablet. Evidence is submitted which shows that the cellulose stroma of the impregnated tablet passes harmlessly through the gastrointestinal tract. The impregnated salt tablets withstand well the high temperatures and humidity of tropical climates, as well as the friction and impacts of handling. They can be made without difficulty by mass-production methods. (X-214)

Skin Disease of Unknown Etiology: During the latter half of 1943 and throughout 1944 a group of related skin disorders, not classifiable as belonging to any of the established dermatologic entities, has appeared in military personnel in the Pacific. Most of the cases have originated in the New Guinea area. The etiology is unknown.

The onset is usually gradual. There is considerable variation in the character of the lesions, both early and late in the disease. The initial lesion may consist of small pruritic areas covered with a fine scale or of a lichenoid papule which is frequently raised and has a rough verrucous surface. Such lesions may appear singly or in patches. Characteristic locations of onset are the face, scalp, arms, hands, legs, buttocks and genitalia. The initial lesions may regress without further spread. However, if the condition progresses, all lesions gradually take on a dark-red or cyanotic color.

The papules and scaly areas may gradually spread in a patchy manner and may or may not become generalized. In the more extensive cases the skin becomes thickened and dark red, particularly in the axilla and groin, and under conditions of increased heat and moisture. In such cases the lesions may become eczematoid in nature with considerable oozing, or may become frankly raw. Pyodermia is an occasional complication. A few of the dermatitic cases run a febrile course and the lesions progress to a stage of exfoliation. In the rare very severe cases the cycle of inflammation and exfoliation may be repeated one or more times.

Certain individuals with this syndrome develop a condition which is compatible with a diagnosis of hypertrophic lichen planus. Atypical features, however, are that the lesions are darker in color, are more extensive and elevated than those ordinarily seen in lichen planus and are associated with lesions similar to those described above.

The prognosis in this group of skin disorders is uniformly good, although recovery may be slow in the small number of individuals who develop the more extensive lesions. It must be emphasized in this regard that the disease is extremely variable in the extent of body involvement as well as in the type of lesion. Small patches on the face or extremities may clear up within a few weeks while a generalized dermatitis may require several months for complete recovery.

Treatment is supportive in character. Emollient preparations, adequate diet and good nursing care appear to be the most effective means of therapy. Bismuth injections have been tried for the lichenoid type of eruption without benefit and are possibly harmful. Sulfonamides and penicillin have been given with uncertain results in a small group of cases, but are possibly deserving of trial in severe cases, particularly those of an eczematoid nature or complicated by pyodermia. (Prof. Div., BuMed - F. A. Butler)

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Public Health Foreign Reports:

Disease	Place	Date	Number of Cases
Plague	Algeria, Algiers	Sept. - Oct. '44	70 (23 fatal)
	Belgian Congo	Sept. 23-30, '44	2
	Fr. West Africa		
	Dakar	Oct. 14-21, '44	13 (fatal)
	Madagascar	Sept. 11-20, '44	4
	Senegal	Sept. 11-20, '44	8 (7 fatal)
	Union of So. Africa	Oct. 1-14, '44	2
Smallpox	Bolivia	Sept. '44	154 (54 fatal)
	Brazil	Jan. 1-Oct. 7, '44	7,812 (11 fatal)
	Colombia	Jan. 1-May 31, '44	1,157 (12 fatal)
	Panama	Sept. '44	1
	Togo	Nov. 4-11, '44	78 (15 fatal)
	Union of So. Africa	May 1-Oct. 1, '44	417 (129 fatal)
Typhus Fever	Algeria	Oct. 1-10, '44	8
	Bolivia	Sept. '44	25 (5 fatal)
	Egypt	Sept. 16-23, '44	31 (4 fatal)
	Guatemala	Sept. '44	117 (15 fatal)
	Hungary	Sept. 16-23, '44	9
	Mexico	Sept. '44	147
	Peru	Aug. '44	79
	Slovakia	Jul. 30-Aug. 12, '44	3
Yellow Fever	Nigeria	Aug. 15, '44	1
	Venezuela	Jul. 16-Sept. 10, '44	21 (suspected, 9 fatal)
		Oct. 16, '44	1

(Pub. Health Foreign Reps., Nov. 17 & Dec. 1, '44.)

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To: All Ships and Stations.

BUMED-Y-BHL
A2-2/EN10

Subj: Quarterly Sanitary Report, Establishment of, and Discontinuance of Monthly and Annual Sanitary Report for Shore Stations Only (Including Hospitals) - Advance Change in Manual of Medical Department.

30 Nov 1944

Refs: (a) Manual of Medical Department, pars. 2691, 2697, 2698, 2700 and 2701.
(b) BuMed ltr A9-1/P2-4(113), of 25 Nov 1943, "Historical Data, Inclusion of in Annual Sanitary Report"; N.D. Bul. Cum. Ed. 1943, 43-1636, p. 492.

1. The changes in the Manual of the Medical Department outlined herein shall be made in the present edition pending a general revision of the manual.

2. The changes in sanitary reports for shore stations, outlined herein, in no way affect the present requirements and procedures for submitting the annual sanitary report for ships.

3. The annual sanitary report for 1944 shall be submitted as usual. Effective 1 January 1945, monthly and annual sanitary reports for shore stations, including hospitals, are hereby canceled and superseded by quarterly sanitary reports.

4. Paragraphs 2691, 2697, 2698, 2700 and 2701 of the Manual of the Medical Department (Ref. (a)) are canceled. Also, Ref. (b) is modified as indicated below. The following instructions shall govern the preparation of the sanitary reports for shore activities (including hospitals), and shall become paragraph 2698 of the present edition of the Medical Department Manual:

"2698. Quarterly Sanitary Report, Shore Stations. - (a) The medical officer of each shore station (including hospitals) shall submit the quarterly sanitary report to the Bureau of Medicine and Surgery as of 31 March, 30 June, 30 September and 31 December to be forwarded not later than the 15th day of the following month. It shall be routed via official channels for endorsement and comment with reference specifically to all recommendations and action to be taken thereon. It is essential that all endorsers include brief statements as to desirability of taking action on recommendations. In cases of specific recommendations made for action by higher authority, the practice of stating "Forwarded" as the only endorsement will defeat a major purpose of the report. District medical officers shall discourage this practice and endeavor to secure endorsements that constitute an evaluation of recommendations and proposed remedial action. Copies of endorsements and comments shall be returned for information of reporting medical officer.

"(b) The discontinuance of the monthly sanitary report does not affect the responsibility of medical officers to conduct frequent inspections of sanitary conditions, and to submit such additional reports as are deemed necessary to the commandant and Bureau of Medicine and Surgery. The purpose of the change is to provide the Bureau of Medicine and Surgery with information that will be more helpful in the direction of a sanitary program for the Navy than the former monthly statements of inspections completed.

"(c) Occurrence of food poisoning, milk or water-borne infections, infectious disease outbreaks believed to be insect borne or related to the prevalence of rodents, or otherwise attributed to insanitary conditions, shall be reported immediately through official channels to the Bureau of Medicine and Surgery, using the subject "Special Sanitary Report."

"(d) Preparation of the new quarterly sanitary report shall be guided by the following three major purposes which these reports are intended to serve. First, to inform the commanding officer of the sanitary conditions on the station, in order to recommend for his consideration needed corrective actions and to report on actions initiated or under way during the period covered. Second, to make recommendations and to report on actions relative to corrective measures which fall under the cognizance of higher authority. Third, to contribute information which will serve as basis for (a) establishing sanitation policies, standards, and practices of the Navy; (b) initiating research on or for improving equipment, facilities, procedures, organization for sanitation; and (c) securing action of Navy Department bureaus having cognizance over activities that are causing insanitary conditions in particular areas.

"(e) The quarterly sanitary report shall conform to the following outline, but deviations may be made if deemed essential by the medical officer in the presentation of pertinent or related facts:

"QUARTERLY SANITARY REPORT
"OF THE
.....
"For the period ending.....

"1. Average Strength

"State the average strength for the period covered by the report, showing the number of officers, enlisted personnel and civilians and designating the number of male and female under each of the three categories. Average strength of enlisted personnel is obtained from number of rations issued and commuted.

"2. Changes in Basic Data

" 'Basic Data' is interpreted to include those environmental factors or conditions and structural details or installations of a fundamental or relatively

fixed nature that are related to health and sanitation. For example, topography and climate, buildings, prison spaces, water supply and sewerage installations, and sick-bay facilities.

"If general basic data for the station has been submitted in an earlier sanitary report, each quarterly report should include only an account of the changes in basic data occurring during the particular quarter.

"3. Evaluation of Sanitation in Terms of Fixed Standards and Minimum Requirements

"Fixed standards and minimum requirements shall be interpreted as those established by Navy Regulations, Manual of the Medical Department, and Bureau of Medicine and Surgery directives and recommendations.

"This section of the report shall give consideration to such subjects as: living quarters, toilet and bathing facilities, water supply and cross connections, swimming pools, mess sanitation, fresh milk supply and Navy ration.

"The content shall be limited to those conditions that do not meet fixed standards and minimum requirements. The reasons for failure of not meeting the standards, and an appraisal of the potential danger shall be discussed in detail.

"4. Evaluation of General Sanitary Conditions

"General sanitary conditions are interpreted to include such subjects as disposal of sewage, garbage and refuse; prevalence and control of insects and rodents; adequacy of clothing and laundry facilities; fungus infections; extra cantonment health hazards; industrial health hazards; sanitary discipline and general 'housekeeping' standards.

"Discussion of these subjects shall be limited to practices that are not considered satisfactory in the opinion of the medical officer.

"5. Special or Unusual Sanitary Problems

"This section shall include a detailed discussion of any special or unusual sanitary problems that may develop during the quarter and action taken to correct the situation.

"6. Recommendations

"The recommendations of the medical officer shall consist of three sections:

"A. Action taken and progress to date of recommendations made (if any) in last sanitary report and any special reports made during the last quarter, including sanitary surveys and sanitation recommendations made by naval epidemiology units and by other investigators and inspectors.

"B. Recommendations for action within the local command, or a statement of action being taken or to be taken within the command relative to unsatisfactory conditions discussed in the current quarterly report.

"C. Recommendations for action by higher authority of a statement of action taken or to be taken by authority other than local command in connection with conditions discussed in the current quarterly report.

"(f) For the preparation of the quarterly sanitary report outlined in paragraph (e), the following list of subjects are submitted as an indication of the scope of information and problems to be covered in this report. The report shall include information pertaining to these subjects only when conditions do not meet the Navy sanitary standards and practices. Additional data not included in the following list of subjects but which are pertinent to the sanitary problems of any station shall be made a part of the quarterly sanitary report:

"1. Topography and Climate - Drainage, flooding, dust, prevailing winds, temperature and humidity extremes and averages.

"2. Public Buildings - Buildings (other than barracks, galleys, mess halls, hospitals, dispensaries, sick bays), with particular reference to sanitation of entertainment centers, theaters, recreation halls, chapels, club buildings, office buildings, and other places where personnel congregate.

"3. Prison Spaces - Cubic capacity, ventilation, heating, lighting and sanitation of cells.

"4. Facilities for Treatment of the Sick - Sick bay (including dispensary, wards, operating rooms, medical storerooms, and venereal-disease prophylaxis rooms), capacity in square feet of floor space and cubic feet, number of berths, equipment and fittings, ventilation, heating, lighting and arrangements for storing medical and surgical supplies, number of sick-bay cots or beds allotted or separated off for surgical, medical isolation, psychiatric, urologic and other type cases by service.

"5. Living Quarters - Number of personnel berthed in quarters, particular attention being given to overcrowding and ventilation; approximate amount of air per person per hour, approximate floor space and air space per person; lighting - amount, means, defects; heating - adequacy, means, defects; screening; general housekeeping standards.

"6. Toilet and Bathing Facilities - Facilities in terms of the number and ratio to personnel of washbowls, faucets, showers, urinals and water closets. Particular attention should be devoted to potential or actual cross connections and protection against back siphonage. The discussion should include facilities for civil employees as well as naval personnel.

"7. Water Supply - Source of supply, protection of source from contamination, method of purification, continuity and adequacy of operation and laboratory control of filter plant, method of chlorination, cross connections in purification plant and distribution system, protection against contamination through cross connection of ships' fire and flushing systems to potable supply ashore, chlorination of new mains or those emptied for repairs, chlorine residuals throughout the distribution system, bacteriologic examinations and statement as to safety and adequacy of supply.

"8. Swimming Pools and Bathing Beaches - Capacity, bathing load, recirculation of water or frequency of change, filtration, chlorination, bacterial

counts, cross connections, adequacy and safety of swimming pools. General statement on safety and use of bathing beaches with reference to sewage contamination or potential sources of contamination and bacterial counts.

"9. Sanitation of Food Storage Spaces, Galleys (including flight ration galleys), Mess Halls, Scullerys - Buildings or space, including Ship's Service stores and other places where food is stored, prepared or served; adequacy and efficiency of refrigeration and water-heating facilities; cleanliness of food handlers and hygiene of civilians employed in places where food is stored, prepared and served; cleanliness of mess gear, utensils and equipment; screening of mess halls, galleys, and other places where food is prepared and served. Include messing facilities for civilians employed on the station.

"10. Fresh Milk Supply (including ice cream and other dairy products) - Standards maintained in procurement, handling, preservation, bacteriological examination and serving.

"11. Navy Ration - Quality, adequacy, variety, preparation.

"12. Disposal of Sewage, Garbage and Refuse - Methods in use, adequacy of facilities and efficiency of operation.

"13. Insect Control - Prevalence of mosquitoes, flies, bedbugs, cockroaches and other insects; control measures and effectiveness.

"14. Rodent Control - Dangers of the problem (if any) and the effectiveness of measures in operation.

"15. Clothing - adequacy, suitability and laundering facilities.

"16. Fungus Infections - Prevalence and the effectiveness of control measures.

"17. Extra Cantonment Public Health Hazards that affect, or may affect the standards of hygiene and sanitation within the naval establishment or endanger the health of the naval or civilian personnel.

"18. Industrial Health Hazards - Consider significant, potential, or real current exposures of civilian or enlisted personnel to industrial health hazards and report the condition or the type of toxic material, number of individuals exposed and methods of control.

"(g) Supplement to fourth quarterly sanitary report, historical data. The historical data shall be treated as an annual narrative report to be included in the fourth quarterly report only. It shall be prepared on separate sheets and attached to the sanitary report so that upon its arrival at BuMed it may be detached and routed to the appropriate office. It shall be a complete account in itself, and independent of the sanitary report, even though this may mean a certain amount of repetition. While recognizing the necessity for keeping reports at a minimum, a complete and accurate record of the experiences of the Medical Department in this war will be of inestimable value for informational purposes and as a guide to plans for future medical organization and activities. With variations according to the type and activity of station, the historical data shall be summarized under the following headings:

"1. Chronology

"Tabular statement giving specific dates, places and outstanding events associated with the history of the station (or Marine Corps activity).

"2. Organization

"Outline the organization of the station and its relation to the larger naval picture (chain of command).

"3. Narrative Account

"Narrative account of medical activities of the station (or Marine Corps activity) and of battle experiences, with emphasis on how the medical system worked and its relation to the larger naval picture, rather than on clinical medicine and surgery. (The account shall be complete and accurate, and it shall be given whatever classification is necessary for security purposes.)

"4. Additional Data and Sidelights on Special Subjects When Applicable

"A. Caring for the sick and wounded.

"B. Evacuation.

"C. Noteworthy incidents in relation to epidemic diseases.

"D. Clinical and professional notes (including data relative to (1) preventive medicine, (2) clinical practices, (3) employment of and results from new and improved drugs, (4) noteworthy cases, (5) other data).

"E. Special problems or noteworthy adaptations in regard to supplies and equipment.

"F. Interesting incidents or "human interest" stories to illustrate particular points.

"G. Any other topics believed to be important in the medical history of the station (or Marine Corps activity).

"5. Conclusion

"A. Most effective portions of the medical program of the station (or Marine Corps activity).

"B. Least effective portions of the medical program of the station (or Marine Corps activity)." --BuMed. W. J. C. Agnew

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To: All Ships and Stations. BUMED-R-JLA
P1-1/P2-5

Subj: Service Number or Officer's File Number, Use of of Form NavMed Y and Form NavMed Av-1 Reports of Physical Examination. 14 Dec 1944

1. In the preparation of reports of physical examination submitted on NavMed Form Y or NavMed Form Av-1, it is directed that the file (serial) number of officers, Navy and Marine Corps, or the service number of enlisted personnel, Navy and Marine Corps, be entered in the space immediately following the individual's name, to facilitate proper identification of medical records in the Bureau of Medicine and Surgery. --BuMed. Ross T. McIntire.

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